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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/092,577	03/08/2002	Manwinder Singh	4320-395	1428

1059 7590 12/03/2004

BERESKIN AND PARR  
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EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/092,577	Applicant(s) SINGH ET AL. <span style="float: right;">S.E.</span>	
	Examiner Krishnan S Menon	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 5-10 and 12-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-10 and 12-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

Claims 5-10 and 12-16 are pending.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 5-8,10 and 12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by, or in the alternative, as obvious over Cote et al (US 5,607,593).

Cote et al teaches a water filtering process comprising providing a tank (1, fig 1) containing filtering membranes (3), introducing feed water and keeping the modules submerged (4; col 9 lines 20-25), withdrawing filtered permeate (10) and retentate (28), introducing a **first gas** in the water in the tank in bubbles which rise past the membrane to inhibit membrane fouling (col 4 lines 18-25, col 3 lines 27-32, col 5 lines 53-55, col 4 line 66 – col 5 line 13, and col 7 lines 37-58), collecting a second gas consisting of gases contained in the bubbles (col 4 lines 32-60; col 9 lines 3-5; hood 12 in fig 1). The first gas would consist of second gas and air because first gas is introduced as bubbles by the claim and the second gas is defined as “gases in the bubbles after they have risen past the membrane”, and air is bubbled through as indicated in col 5 lines 45-60. Re the implied recycling in the claim, Cote teaches recycling in col 4 lines 45-48 – gases are recovered and reinjected. In claim 6, first gas includes carbon dioxide’ is an

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inherent property of the system because the CO<sub>2</sub> is part of the “gases contained in the bubbles after they have risen past the membrane”, which is through water, and the oxidation of the biodegradables (col 6 lines 22-28) would inherently produce gases, typically carbon dioxide. When the prior art device (in this instance, a device that bubbles air in water) is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. “The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness.” In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983).

With regard to the newly added steps (g), (h) and (i) in claim 1: collecting air from the atmosphere – col 5 lines 45-60 and figs. 7 and 8 teach adding air in to the ozone circuit. Mixing collected air with second gas – fig 7 and 8 does depict mixing collected air with second gas. Exhausting portion of second gas: the system inherently exhausts portion of second gas – the portion of bubbles that escapes from the water in the reactor 1.

Re claim 7, the second gas is 80% of the mixture implies 80% of the gas streams are recycled. Cote does not specifically teach how much of the gases are recycled in col 4 lines 45-48. However, this would be a result-effective variable, and can be

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optimized on process economics and contamination levels in the second gases. The same is true for claim 12.

Claim 8: scaling tendencies is an inherent property of the feed water.

Regarding claim 10, Cote teaches adding coagulants to the feed water in the tank (col 1 lines 20-25; col 2 lines 29-35)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cote (593) in view of Dickerson et al (US 6,221,254 B1) and Cote et al (US 6,245,239 B1).

Cote'593 teaches all the limitations of claim 5. Claim 9 adds further limitations, which are not taught by Cote. Dickerson teaches using recycled CO<sub>2</sub> in a concentration greater than in air (col 6 lines 30-35; abstract; col 5 lines 4-59; claim 1; col 9 lines 33-37). Cote'239 teaches the superficial velocity as between 0.01 – 0.015 for a membrane aeration system. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Dickerson and Cote'239 in the teaching of Cote'593 to have improved filtration including pH control below 8, coagulation, precipitation, and then floatation of biological contaminants in the water using microfine bubbles of CO<sub>2</sub>

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gas (see Dickerson col 5 lines 4-60; with use of filters in col 9 lines 55-65), and for maintaining the membrane surface clean as taught by Cote'239. Regarding the pH being maintained below 8 when the Langlier Scaling index  $>0.5$ , pH being maintained at all times in the reference encompasses this limitation. The scaling index  $>0.5$  is only an inherent property of the wastewater.

Claim 13 recites step for the function of creating the second gas, which is provided by the tightness of a hood over a tank. Cote'593 teaches a hood for collection of second gas – 12, fig 1, but does not teach the specifics of recycling the second gas. Means for vacuum induced recycling flow of second gas is taught by Dickerson – see col 9 lines 32-37 and the figure. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Dickerson in the teaching of Cote'593 for recycling the second gas pH control, coagulation, etc as taught by Dickerson.

3. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickerson et al (US 6,221,254 B1) in view of Cote (593) and Cote (239).

Claim 14: Dickerson teaches a process for treating water (having scaling tendencies of water - is inherent in water) by providing a tank (10), introducing feed water into the tank (line 1) (Langlier scaling index  $>0.5$  is an inherent property of the water), introducing a gas into the tank in bubbles and increasing the concentration of carbon dioxide in the gas by mixing carbon dioxide collected from the bursting bubbles into the gas (see CO<sub>2</sub> recycle in col 5 lines 19-24 and fig 1).

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Dickerson does not teach tank containing filtering membrane modules, withdrawing permeate and retentate from the tank, bubbles rising past membrane to inhibit fouling of the membrane, and superficial velocity of at least 0.01 m/s. Cote '593 teaches a process for treating water by providing a tank with submerged membrane and gas bubbles for inhibiting membrane fouling (see figures). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Cote'593 in the teaching of Dickerson for water purification to obtain potable water more efficiently as taught by Cote'593 (col 1 line 5 col 2 line 20). Gas superficial velocity at least 0.01 m/s is taught by Cote 239— col 6 lines 45-60. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Cote 239 in the teaching of Dickerson because Dickerson does not teach the gas flow rate required.

Claim 15: pH, 8 – see Dickerson abstract.

Claim 16: water in the tank has free surface in communication with atmosphere – see Cote'593: tank has a free head-space above the liquid.

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### ***Response to Arguments***

Applicant's arguments filed 11/1/04 have been fully considered but they are not persuasive.

In response to the argument that the added limitations in claim 5 are not provided by Cote'593 – see the rejection. With re to Cote adding ozone and therefore not essentially consist of a mixture of second gas and air: second gas in this instance will have ozone, and as discussed in earlier office actions, ozone is for the most part is air.

The Cote system does show air intake as shown in the rejection. Re bubbles in water having CO<sub>2</sub>, this was also discussed in the earlier office action. Re gas collected from the burst bubbles not collected by Cote, this is not claimed in claim 5, and even if so, would not make it patentable because the bubbles carried over by the recycling water will have the same composition as the bubbles that burst. Re the argument against inherency that CO<sub>2</sub> concentration in the gases recycled will be more that of air: the recycled gases in Cote would get CO<sub>2</sub> from the water in the same manner as in the applicants' system; more over, the oxidation of the biomass in the water by ozone generates more CO<sub>2</sub>.

Re the argument that all feed waters do not have scaling tendencies – mere argument is not enough, applicants need to show this with evidence: [T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Argument re claim 13: In response to applicant's argument that office action does not provide how a combination of Dickerson and Cote would teach drawing a flow of air from the atmosphere in to a vacuum induced flow of the second gas, the test for obviousness is not whether the features of a secondary reference may be bodily

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incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

### ***Conclusion***

This is in response to an RCE and is made non-final because of the new claims 14-16.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


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